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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER
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3

DATE MAILED:

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

☒ Responsive to communication(s) filed on _____

This action is **FINAL**.

☒ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s) or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1 thru 21 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1 thru 21 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- The specification is objected to by the Examiner
- The oath or declaration is objected to by the Examiner

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d)
- * All ☐ Some ☐ None ☐ of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) _____

received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s) _____
- Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152

-- SEE OFFICE ACTION ON THE FOLLOWING PAGES --

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DETAILED ACTION

1. The disclosure is objected to because of the following informalities:

On page 4 of the specification the units for T and t were omitted.

On page 16 (lines 13 and 14) figure 4B does not show reference 109 as described.

Appropriate correction is required.

Double Patenting

2. The non-statutory double patenting rejection, whether of the obviousness-type or non-obviousness-type, is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent. *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); and *In re Goodman*, 29 USPQ2d 2010 (Fed. Cir. 1993).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(b) and (c) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.78(d).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1 thru 5 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6 thru 10 of U.S. Patent No. 5,712,191 in view of Garfinkel.

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Nakajima shows a method comprising the steps of: forming a region equivalent to a single crystal in an amorphous silicon film on a substrate (quartz) having an insulating surface; forming a selective layer of a metal element that accelerates the crystallization of the silicon in contact with the amorphous film; patterning the amorphous film; and heating the film between 400°C and 600°C. (See column 4).

The difference between the claims and the prior art is that after the film is heated an etching step is done.

Garfinkel shows a method of producing a small semiconductor. The substrate is coated with an insulating layer of silicon dioxide (amorphous). The film is exposed to heavy nuclear particle irradiation which produces a damage track in the unshield regions of the silicon layer. A mask is deposited in top of the silicon dioxide film to delineate a pattern on the film. The mask comprises a layer of molybdenum (promoting material), and the film is annealing at 600°C to 800°C for an hour prior to a selective etching step with buffered hydrofluoric acid solution, resulting in a hole through a layer for each damage track. In this instance, the annealing step may be omitted, since there no damaged regions produced in the unetched portion of the insulating or passivating layer. (See columns 1 thru 6).

It would have been obvious to one of ordinary skills in the art at the time the invention was made to modify the Nakajima method by the teaching of Garfinkel in order to remove the crystal defects and obtain a better crystal.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 thru 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garfinkel in view of Mori.

Garfinkel shows a method of producing a small semiconductor. The substrate is coated with an insulating layer of silicon dioxide (amorphous). A protective layer is formed on the insulated layer. The film is exposed to heavy nuclear particle irradiation that produces a damage track in the unshield regions of the silicon layer. A mask is deposited in top of the silicon dioxide film to delineate a pattern on the film. The mask comprises a layer of molybdenum (promoting material), and the film is annealing at 600°C to 800°C for an hour prior to a selective etching

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step with buffered hydrofluoric acid solution, resulting in a hole through a layer for each damage track. In this instance, the annealing step may be omitted, since there no damaged regions produced in the unetched portion of the insulating or passivating layer. (See columns 1 thru 6).

The difference between the claims and the prior art is that the substrate should be made of quartz.

Mori teaches a method for manufacturing crystalline film in which a quartz substrate is use. A pattern thin film is deposited on the substrate and contained a metal. Then the substrate is heated a temperature higher than 377°C. (See columns 1 thru 5).

It would have been obvious to one of ordinary skills in the art at the time the invention was made to modify the Garfinkel method by the teaching of Moris in order to able to use high temperatures to obtain high crystallinity.

6. Claims 1 thru 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima in view of Garfinkel.

Nakajima shows a method comprising the steps of: forming a region equivalent to a single crystal in an amorphous silicon film on a substrate (quartz) having an insulating surface; forming a selective layer of a metal element that accelerates the crystallization of the silicon in contact with the amorphous film; patterning the amorphous film; and heating the film between 400°C and 600°C. (See column 4).

The difference between the claims and the prior art is that after the film is heated an etching step is done.

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Garfinkel shows a method of producing a small semiconductor. The substrate is coated with an insulating layer of silicon dioxide (amorphous). The film is exposed to heavy nuclear particle irradiation which produces a damage track in the unshield regions of the silicon layer. A mask is deposited in top of the silicon dioxide film to delineate a pattern on the film. The mask comprises a layer of molybdenum (promoting material), and the film is annealing at 600°C to 800°C for an hour prior to a selective etching step with buffered hydrofluoric acid solution, resulting in a hole through a layer for each damage track. In this instance, the annealing step may be omitted, since there no damaged regions produced in the unetched portion of the insulating or passivating layer. (See columns 1 thru 6).

It would have been obvious to one of ordinary skills in the art at the time the invention was made to modify the Nakajima method by the teaching of Garfinkel in order to remove the crystal defects and obtain a better crystal.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evelyn Defillo whose telephone number is (703) 305-4635. The examiner can normally be reached on Monday thru Friday from 7:15 A.M. to 3:35 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Breneman, can be reached on (703) 308-3324. The fax phone number for this Group is (703) 305-3600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

ROBERT KUNEMUND
PRIMARY PATENT EXAMINER
FBI

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